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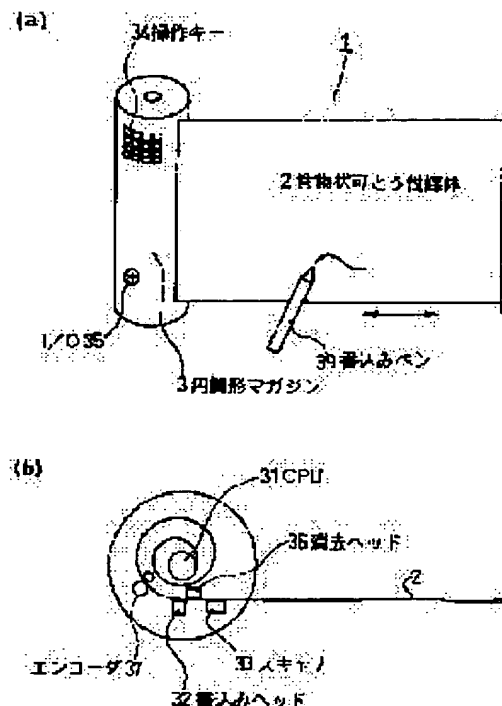
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(54) SCROLL-TYPE DISPLAY CAPABLE OF CONTINUOUS DISPLAY

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a scroll-type display device in which a flexible medium rewritable at a high speed as a display is made freely drawnable and insertable in and out of a magazine-type case.

SOLUTION: In this scroll-type display, a flexible medium 2 rewritable as a display is stored in a scroll state within a cylindrical magazine-type case 3 to be freely re-windable. The scroll-type display can be read and written with a CPU 31, a writing head 32, a scanner 33, or the like, built in the case 3, and can be freely additionally written and erased with a writing pen 39.



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CLAIMS

[Claim(s)]

[Claim 1] The roll type display which is characterized by containing the flexible family name medium in which a continued display is rewritable [as a display] free [rewinding], and possible in the shape of a roll in the magazine type case of a cartridge and in which a continued display is possible.

[Claim 2] The roll type display which is characterized by the aforementioned flexible medium displaying using migration of the electrical and electric equipment or the MAG and in which a continued display according to claim 1 is possible.

[Claim 3] The aforementioned flexible medium is a roll type display which is characterized by being a thing containing the mixolimnion of a particle and a fluid opaque medium including a coloring object and in which a continued display according to claim 2 is possible.

[Claim 4] The aforementioned flexible medium is a roll type display which is characterized by being a thing containing the mixolimnion of the particle and the fluid opaque medium containing the magnetic substance and in which a continued display according to claim 2 is possible.

[Claim 5] The roll type display which is characterized by having arranged the display control section containing CPU which controls the display of the aforementioned flexible medium in the magazine type case of the aforementioned cartridge and in which a continued display according to claim 1 is possible.

[Claim 6] The roll type display which is characterized by equipping the aforementioned display control section with communication facility with a host computer and in which a continued display according to claim 5 is possible.

[Claim 7] The roll type display which is characterized by equipping the aforementioned display control section with the read of the aforementioned flexible medium, and/or writing / elimination function and in which a continued display according to claim 5 or 6 is possible.

[Claim 8] The roll type display which is characterized by performing the aforementioned write-in function by the write head which arranges two or more magnetic cells and changes and in which a continued display according to claim 7 is possible.

[Claim 9] The roll type display which is characterized by performing the aforementioned write-in function by the write head which arranges two or more magnetic field generators and heating elements, and changes and in which a continued display according to claim 7 is possible.

[Claim 10] The roll type display which is characterized by performing the aforementioned write-in function with the pen type head in which a postscript and elimination are possible and in which a continued display according to claim 7 is possible.

[Claim 11] The roll type display which is characterized by the aforementioned pen type head being removable in the magazine type case of the aforementioned cartridge and in which a continued display according to claim 10 is possible.

[Claim 12] The roll type display characterized by having arranged automatically the spool in which winding and rewinding are possible for the aforementioned isomorphous magazine type roll-like flexibility medium to the opposite side of the magazine type case of the aforementioned cartridge in a roll type display according to claim 5.

[Claim 13] The roll type display characterized by having the I/O terminal which contains one or more of CPU, the write head and the erase head, a read scanner, and the encoders in the aforementioned spool, and/or makes communication possible with a computer outside in a roll type display according to claim 12.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the display unit using the flexible medium in which a continued display is [that high-speed roll-like rewriting is possible and] possible especially about the display unit for a display.

[0002]

[Description of the Prior Art] As conventional display, there is a display unit for a display using the liquid crystal used even for the electrochromatic display a color TV and for personal computers from the monochrome LCD display of a clock, a camera, etc., Light Emitting Diode mainly used for a segment display etc., the plasma display which can constitute the color display of large-sized and a flat-surface type by the electroluminescence. However, in the above-mentioned conventional example, when the power supply was shut off, even if display, such as liquid crystal, Light Emitting Diode, and plasma, says that all displays will also disappear and shut off the power supply, it had the problem that the power curtailment / storage maintenance type display action that a display can be held was impossible. Therefore, there was a problem of wasting paper whenever it prints, since there will be only the method of printing a picture by the printer etc. if it is going to leave a display image.

[0003] Then, recently, the possible thing has also been developed for the storage maintenance type display action by impressing electric field, heat, and the MAG with the record medium in which display rewriting is possible. as the electric-field type display of the shape for example, of a sheet itself -- as a "GURIKON electric paper" -- a magazine "SID98DIGEST" -- it is introduced to the 1010-1013rd page That is, it is a display with a thickness of 0.12-0.8mm which carried out bonding of the dichroic sphere of the size whose diameter is 25-100 micrometers between polyester sheets, and a dichroic sphere rotates between the polyester sheet by giving electric field (for example, 40nano J/(square centimeter)), a direction is reversed, the color which was visible until now disappears, and another color appears. Since it adheres to the wall surface of the cavity in which the sphere has held the sphere once rotating, this state is maintained after removing electric field. That is, the record state will continue and will be displayed. Record is eliminated by giving electric field conversely. As a sheet-like heated type display, the sheet-like heated type display is introduced, for example to "the electronic-intelligence communication society technical research report CPM 83-18." That is, if heat is given and the temperature is made a heated type medium from the exterior more than predetermined temperature, color with the another original color will be presented, if it cools conversely, it recolors in the original color, and as a material, it is Ag₂HgI₄, for example. It is, and it is below predetermined temperature, is yellow and more than predetermined temperature, and becomes orange. It is this Ag₂HgI₄ on transparent polyester film. It applies and another transparent polyester film is formed in the shape of sandwiches through a glue line. Performing informational record by the thermal head, maintenance performs ordinary temperature or a heater, and elimination electronically using the thermoelectric-cooling equipment using the Peltier effect. Respectively, it arranges in one train, and it carries out to line sequential, or it arranges in the shape of a field, and carries out by Junji Men. Moreover, the sheet-like MAC type display itself is well-known. Using the magnetic phenomenon in which a magnet attracts iron powder, by giving a magnetic energy to a record medium by the recording head, magnetic powder (toner) suction is performed and after removal of a magnetic energy continues magnetic powder suction to a record medium by remnant magnetism. Elimination is performed by demagnetizing remnant magnetism with the erase head. as the charge of a magnetic powder material -- gamma-Fe₂O₃, Co-nickel-P, and CrO₂ etc. -- it is used When the display panel was constituted, or it tied annularly, it considered as the shape of an endless paper and information was changed combining this and a line head using the record medium by such electric-field control, thermal control, and magnetic control in which a continued display is possible, while the endless medium rotated or the head moved, the head was driven, and the

display unit for a display which rewrites the contents of a display was known. However, all lacked that the display made with such a record medium was as that it is an endless paper-like **** [and] in portability and practicality. [tha it is a panel-like]

[0004]

[Problem(s) to be Solved by the Invention] Then, it is for providing about the roll type display which it makes a power curtailment type display action possible so that a display may hold even if the picture in which this invention gave a high-speed picture rewriting indication possible, and wrote it on a flexible display medium by the writing to the rewritable type flexibility medium of the shape of a roll which used the electrical and electric equipment and the magnetic write head is removed in a driving source, and makes possible in the gestalt which can carry out the image display of the rewritable type flexibility display medium from a magazine free to

[0005]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, invention according to claim 1 is characterized by containing the flexible family name medium in which a continued display is rewritable [as a display] free [rewinding], and possible in the shape of a roll in the magazine type case of a cartridge. Moreover, invention according to claim 2 is characterized by the aforementioned flexible medium displaying using migration of the electrical and electric equipment or the MAG. Moreover, invention according to claim 3 is characterized by the aforementioned flexible medium being a thing containing the mixolimnion of a particle and a fluid opaque medium including a coloring object. Moreover, invention according to claim 4 is characterized by the aforementioned flexible medium being a thing containing the mixolimnion of the particle and the fluid opaque medium containing the magnetic substance. Moreover, invention according to claim 5 is characterized by having arranged the display control section containing CPU which controls the display of the aforementioned flexible medium in the magazine type case of the aforementioned cartridge.

[0006] Moreover, invention according to claim 6 is a roll type display which is characterized by equipping the aforementioned display control section with communication facility with a host computer and in which a continued display according to claim 5 is possible. Moreover, invention according to claim 7 is characterized by equipping the aforementioned display control section with the read of the aforementioned flexible medium, and/or writing / elimination function. Moreover, it is characterized by invention according to claim 8 performing the aforementioned write-in function by the write head which arranges two or more magnetic cells and changes. Moreover, it is characterized by invention according to claim 9 performing the aforementioned write-in function by the write head which arranges two or more magnetic field generators and heating elements, and changes. Moreover, it is characterized by invention according to claim 10 performing the aforementioned write-in function with the pen type head in which a postscript and elimination are possible. Moreover, invention according to claim 11 is characterized by the aforementioned pen type head being removable in the magazine type case of the aforementioned cartridge. Moreover, invention according to claim 12 is characterized by having arranged automatically the spool in which winding and rewinding are possible for the aforementioned isomorphous magazine type roll-like flexibility medium to the opposite side of the magazine type case of the aforementioned cartridge in the roll type display according to claim 5. Moreover, invention according to claim 13 is characterized by having the I/O terminal which contains one or more of CPU, the write head and the erase head, a read scanner, and the encoders in the aforementioned spool, and/or makes communication possible with a computer outside in the roll type display according to claim 12.

[0007] According to the above composition, after pulling out a flexible roll-like display medium from a magazine and displaying a picture, it can rewind in a magazine again. Moreover, display by control of a personal computer, a postscript and writing are attained using personal computer information, writing of a picture, elimination, and read can perform freely to a roll-like flexibility medium, communication with an external computer is also attained and effects, like the postscript of a display and elimination are attained are acquired by tracing the front face of a flexible medium with a postscript pen through an I/O terminal.

[0008]

[Embodiments of the Invention] Hereafter, the gestalt of operation of the 1st of this invention is explained with reference to drawing. Drawing 1 is the perspective diagram of the roll-like flexibility medium display concerning the gestalt of operation of the 1st of this invention. Drawing 2 is the cross-section enlarged view of the capsule type flexibility medium in electric-field mode, and drawing 3 is the expanded sectional view of the microcapsule type two-color ball formula flexibility medium in electric-field mode. Moreover, drawing 4 is the expanded sectional view of the microcapsule type pigment formula flexibility medium in electric-field mode. On the other hand, drawing 5 is the expanded sectional view of the capsule type flexibility medium in magnetic field mode, and drawing 6 is the expanded sectional view of the microcapsule type flexibility medium in magnetic field mode. And drawing 7 is drawing showing

the magnetization property of the magnetic substance for explaining the principle of the flexible medium in heat and magnetic mode. In drawing 1, drawing 1 (a) is the energization force which the perspective diagram of the whole roll type display of this invention is shown, 1 is the roll type display, and the flexible medium in which the continued display of 2 for a display is possible, and 3 are usually carrying out the winding receipt of the flexible medium 2 like a film, and built in the spring (not shown), and is a cylindrical shape magazine type case which rewinds the pulled-out flexible medium 2. 34 is an operation key group which operates internal equipment (after-mentioned), and 55 is an I/O terminal linked to an external computer etc. Drawing 1 (b) is the cross section of the magazine type case shown in drawing 1 (a), CPU of the shape of a cylindrical shape in which 31 forms a personal computer, and 32 are the electrical and electric equipment or the magnetic write head, and a scanner for read in 33, 36 is a head for elimination and many scanner 33 and heads 36 for elimination magnetic write head 32 and for read are perpendicularly arranged in the shape of a line with the drawing, respectively. Since, as for 37, the position data (a thing like the perforation of a film) of the roll-like flexibility medium 2 are also obtained with an encoder, the display of search of a display image etc. is also attained.

[0009] The flexible medium 2 can be displayed using migration of the electrical and electric equipment or the MAG. For example, the capsule type flexibility medium in the electric-field mode shown in drawing 2 mixes the dielectric pigments (TiO₂ etc.) 5 into a medium 4, and impresses electric field in a transparent electrode. When electric field are impressed to the degree in which the color of a pigment 5 is not conspicuous since a pigment is in a uniform mixing state in a medium 4 when there is no impression of electric field from the exterior by the DC power supply from the exterior at a transparent electrode, the dielectric pigment 5 in a medium 4 comes to look in the color of a pigment above the drawing in a medium 4 by electric field like drawing 2 (A), polarization or when [since it was drawn in,] a drawing top to a capsule is Then, even if it turns OFF the DC power supply and abolishes electric field, like drawing 2 (B), with residual charge, frictional resistance, etc., the dielectric pigment 5 in a medium 4 maintains a state [polarization or being drawn in] above the drawing in a medium 4, and the color of a pigment maintains it. Since polarization or the attracted dielectric pigment 5 is attracted below like drawing 2 (C) and it is dispersed to a rose rose, a pigment will be in a uniform mixing state into a medium 4, and the color of a pigment 5 will stop and being upwards conspicuous if electric field are impressed to a transparent electrode with drawing 2 (A) by the DC power supply from the exterior at a retrose. Of course, if it continues giving retrose electric field, it will be completely polarized or drawn in down the drawing in a medium 4, and the color of a pigment 5 will disappear completely.

[0010] The microcapsule type two-color ball formula flexibility medium in the electric-field mode shown in drawing 3 encloses many things which dedicated the two-color ball 7 of the coloring object A attracted by right electric field, and the coloring object B repelled by right electric field in the cavity (microcapsule) in a binder 8, and impresses electric field by transparent electrodes 6 and 6. then, electric field are impressed by the transparent electrode 6 from the exterior -- having (it being a positive electrode to the upper transparent electrode 6 at drawing 3) -- when the coloring objects A attracted by the right electric field of the two-color ball 7 become facing up all at once and it sees from the drawing bottom, it comes (drawing 3 (A)) to be visible to A color of a coloring object After it, even if it removes external electric field, A color grain maintains a state with this by friction with a cavernous wall surface (drawing 3 (B)). And when it sees from a top, B color of a coloring object can come to be seen, since the coloring objects B which the coloring object A in a microcapsule is attracted down the drawing, and are conversely repelled by right electric field will turn to the drawing bottom all at once if reverse electric field are impressed like [exterior] drawing 3 (C).

[0011] The microcapsule type pigment formula flexibility medium in the electric-field mode shown in drawing 4 encloses many microcapsules 7 which mixed the pigment 5 attracted by electric field into the medium (for example, nebula liquid) 4 in a binder 8, and impresses electric field by transparent electrodes 6 and 6. Then, when electric field were impressed to the transparent electrode 6 from the exterior, and the pigment 5 in nebula liquid 4 is attracted upwards and it sees from the drawing bottom like drawing 4 (A), the color of a pigment 5 can come to be seen. After it even if it removes external electric field, a pigment 5 maintains a state with this by friction with a microcapsule wall surface (drawing 4 (B)). And since the pigment 5 in a microcapsule 7 will be attracted down the drawing if reverse electric field are impressed like [exterior] drawing 4 (C), the color of nebula liquid 4 can come to be seen.

[0012] The capsule type flexibility medium in the magnetic field mode shown in drawing 5 mixes magnetic powder 5' into medium 4', prepares thin layer 6" of the transparent magnetic substance in a front face, and impresses a magnetic field in magnet (magnetic head) 6'. When magnet 6' was brought close to a capsule type flexibility medium from the exterior and a capsule is seen from the drawing bottom since magnetic powder 5' of medium 4' Naka was attracted above the drawing by the magnetic field, it comes (A of drawing 2) to be visible to the black of magnetic powder 5' . Then, even if it removes magnet 6', like drawing 5 (B), by the remnant magnetism of thin layer 6" of the transparent magnetic substance, a state as it is is maintained and the black of magnetic powder 5' continues. and magnet 6' -- a

capsule type flexibility medium -- caudad -- bringing close -- if -- a magnetic field -- medium 4' -- since inner magnetic powder 5' is attracted down the drawing, when a capsule is seen from the drawing bottom, the black of magnetic powder 5' disappears and the color of medium 4' can come (drawing 5 (C)) to be seen [black] Of course, the magnetic head can be used instead of a magnet. Although a coil is theoretically rolled and energized to cores, such as a ferrite and cobalt, as the magnetic head in this case and magnetic flux is generated, the device of the various kinds for multichannel-izing is given, and 450dpi,-dimensional [of thousands of or more channels / 1], and a two-dimensional full line multi-head are also possible by the formation of a head array etc. at A4.

[0013] the magnetic powder 5 by which the microcapsule type flexibility medium in the magnetic field mode shown in drawing 6 is attracted by the magnetic field -- a medium (for example, nebula liquid) 4 -- 'the microcapsule 7 mixed in inside' -- a large number -- transparent magnetic-substance binder 8' -- it encloses inside and a magnetic field is impressed in magnet 6' Then, when the magnetic field was impressed by magnet 6' from the exterior, and magnetic powder 5' in nebula liquid 4 is attracted upwards and sees from the drawing bottom like drawing 6 (A), the black of magnetic powder 5' can come to be seen. even if it removes an external magnetic field after it -- the remnant magnetism of transparent magnetic-substance binder 8' -- magnetic powder 5' -- a state with this is maintained (drawing 6 (B)) and if an opposing magnetic field is impressed like [exterior] drawing 6 (C), the remnant magnetism of transparent magnetic-substance binder 8' will demagnetize -- having -- a microcapsule 7 -- 'the inner magnetic powder 5' -- medium 4' -- it becomes a rose rose in inside and the color of medium 4' can come to be seen Of course, the magnetic head can be used instead of a magnet. Although a coil is theoretically rolled and energized to cores, such as a ferrite and cobalt, as the magnetic head in this case and magnetic flux is generated, the device of the various kinds for multichannel-izing is given, and 450dpi,-dimensional [of thousands of or more channels / 1], and a two-dimensional full line multi-head are also possible by the formation of a head array etc. at A4.

[0014] Drawing 7 is drawing showing the magnetization property of the magnetic substance for explaining the principle of the flexible medium in heat and magnetic mode, usually, if a magnetic field is added to the record material of the magnetic substance by the magnetic head at the time of low temperature, since a coercive force and remnant magnetism are large, record material will show the big hysteresis characteristic which big magnetization remains and is shown in drawing 7 (a), and magnetization will be stably held by the meantime. However, if the temperature of such a ferromagnetic is raised and it goes, the hysteresis characteristic becomes thin gradually like drawing 7 (b), when Curie temperature is reached at last, spontaneous magnetization is set to 0 and there is a property of losing the property as a ferromagnetic. Use this phenomenon for the writing by the magnetic head, and it is made to shift to a property like drawing 7 (b) by heating the hysteresis characteristic at the time of low temperature like drawing 7 (a), and it becomes possible, when improvement in the speed of on-off control is promoted or control of the elevated-temperature demagnetization by heating, elevated-temperature flux reversal, etc. uses a heating element together. Thus, since the magnetic head is controllable by temperature, rewriting by temperature mode is also attained.

[0015] As mentioned above, each explanation of drawing 2 - drawing 7 is explanation of one electrode or a magnet (magnetic head) unit. Many such electrodes or magnet (magnetic head) units are arranged in all directions by the flexible medium 2 of drawing 1 , required transparent wiring is made for every unit, and wiring is connected to CPU (drawing 9 , 21).

[0016] As mentioned above, by constituting from a flexible medium in which display rewriting is possible in the shape of a roll using electrophoresis or magnetic migration, it can be dealt with like a roll and becomes the simple display of handling. Drawing 8 is another example of writing and composition of reading at the display by such flexible medium 2. Drawing 8 (a) and (b) are written-in examples which carry out a scan up and down by line head 86 grade. Moreover, it is the example written in by the magnetic head 87, and drawing 8 (b) is an example added and eliminated with the magnetic pen 88, by tracing a screen with the magnetic pen 88, a postscript can be added and drawing 8 (c) can be eliminated. It is the example which reads the screen added and eliminated in the magnetic pen 88 grade with the line scanner 89 of CCD, and drawing 8 (e) carries out the scan of the display screen from a top to the bottom, and the data which read and read the picture can be inputted into the memory in a magazine 3 (drawing 9 , 22), or it can transmit them. These writing and the reading technology itself are common knowledge, and explanation is omitted.

[0017] Operation of elimination by the write head 32 by the operation as this also with the same roll type display 1 shown in drawing 1 write in and according to the erase head 36, a postscript, elimination with a scanner 33, etc. read and according to the write-in pen 39, etc. is performed by the same operation with having explained above. In this case although the read head and the write head are arranged in the length direction of a roll in drawing 8 , it differs in that read and the write head are arranged crosswise [of a roll] in the magazine of drawing 1 . Thus, the display gestalt which the display excellent also in portability can constitute, in addition is rich in various varieties becomes possible using magnetic migration or electrophoresis by constituting the flexible medium 2 in which display rewriting is

possible in the shape of a roll, as shown in drawing 1 .

[0018] Drawing 9 is the block diagram showing the composition of the display control section (personal computer) 9 which controls the display of the roll type display 2. The display control section 9 is for controlling the display of the roll type display 2, and is equipped with CPU21, ROM22, RAM23, an external interface 24, a communication interface 25, the bit map memory 26, and the display controller 27. DDO, magnetic-disk FD, etc. are connected to an external interface 24 to a postscript pen, a keyboard, a CCD scanner, write-in equipment, a reader, and a field. CPU21 displays the data about processing of the data based on communication with a central host (with no illustration), control of the bit map memory 26, and decode processing of the data in RAM23, i.e., the display in RAM22, on the roll type display 2 through an external interface 24, or controls storing the display information transmitted through an external interface 24 from CCD, the reader, etc. in ROM22 etc. ROM22 memorizes the operation procedure of CPU21. A communication interface 25 interfaces data communication with a central host. the data about the display of the data with which CPU2 delivered and received the bit map memory 26 from the central host -- what is directly recorded on the roll type display 2 inside (bit map data) is stored The display controller 27 displays the bit map data in the bit map memory 26 on the roll type display 2. RAM23 stores data other than the aforementioned bit map data, and shines, and the display information transmitted through an external interface 24 from CCD, the reader, etc. is stored. A postscript pen is used in the case of the writing, a correction, deletion, and a postscript of the information on the roll type display 2 top. A keyboard is used in the cases, such as the writing, read-out, creation, change, a monitor, preservation, etc. of various programs. A scanner is used in the information's on roll type display 2 read-out case. Write-in equipment is used in case information is written in to up to the roll type display 2. Moreover, it is convenient, if it is the writing, read-out, creation, change, the monitor, preservation, etc. of an easy program and you will give a part of function of a keyboard to the above-mentioned operation key group 34 (drawing 1) and a postscript pen.

[0019] Although drawing 8 is the example of the writing and reading by line scan, drawing 10 is the perspective diagram of the non-portable high-speed writing and reader which can perform a field scan. In drawing 10 , 11 is the writing/reader to the roll type flexibility medium by the above-mentioned this invention. The multi-head of a high-density multichannel is possible, by application of a thin film technology, vertical recording, etc., since it becomes package writing by two-dimensional array, if a write time is also compared with a line head etc., using A4 edition 1 page as about 300 dpi, it will become high speed considerably, and the speed for about 0.1 seconds is possible also for the magnetic head used for this. If writing is for example, a magnetic-head type, writing will be performed by the flux reversal by the current passed for every single head corresponding to a picture signal, and read is performed by change of the induced current to which read flows from the magnetic substance of the display medium 2 to a magnetic cell. 12 is the set mouth of the paper-like display 2, and 13 is means of communications with a host computer. If the handling of this writing/reader is explained, the part for which the flexible medium 2 asks from the roll type display 1 will be pulled out, and an insertion set will be carried out at the display set mouth 12 of write-in equipment 11. If the flexible medium 2 is set, writing / reader 11 will perform package writing for A4 edition 1 page by high-speed printing for 0.1 or less seconds by the two-dimensional multi-head based on the transfer data from computers (for example, host computer [Although not illustrated] of the head office etc.). Moreover, when there are a drawing to transmit to a computer from the direction of the flexible medium 2, a changed screen, writing / reader 11 transmits ***** and reading data to a computer through means of communications 13 by writing in similarly and inserting in the set mouth 12 of equipment 11 collectively. Moreover, only when the screen print-out from a computer changes on the occasion of writing, the rewriting writing of the flexible medium 2 is performed. The above can arrange and use well-known electric writing / reader similarly, when using the medium using electrophoresis to the writing/reader to the sheet-like flexibility medium 2 using magnetic migration, although and.

[0020] Next, the gestalt of operation of the 2nd of this invention is explained with reference to drawing. Drawing 11 is the perspective diagram of the roll-like flexibility medium display concerning the gestalt of operation of the 2nd of this invention in which automatic winding rewinding is possible. In drawing 11 , a spool 113 can contain a motor (not shown) in the interior, and can wind up, display and rewind the roll-like flexibility medium 2 like the cartridge of a film, and a receiving spool exactly. A button 114 is an operation button for motorised. Moreover, the composition of the cylindrical shape magazine type case 3 is the same as the gestalt of the 1st operation, and operation of the postscript with elimination by the write head 32 write in and according to the erase head 36, the read transfer with a scanner 33, the write-in pen 39, or the magnetic pen 88 etc. is performed similarly. Thus, in the case of the gestalt of operation of the 2nd of drawing 11 , since it winds up and rewinding is possible, an automatic picture (still picture) to display is pulled out freely, and it can be displayed and placed as he likes.

[0021] You may make it give the function as a magazine 3 that it is the same in a spool 113, as an example of improvement of the gestalt of the 2nd operation. Namely, although only a motor system is built in in a spool 113 and it

can be made to perform automatic winding and rewinding with the gestalt of the 2nd operation By making the write head 32, the erase head 36, and scanner 33 grade build in like the gestalt of the 1st operation in a spool 113, and giving this the same function as a magazine 3 Since a spool 113 side can also operate elimination by the write head 32 write it and according to the erase head 36, the read transfer with a scanner 33, etc., its operability improves further.

[0022] The gestalt of the 3rd operation makes removable the postscript pen (pen type head) 39 or 88 to the medial-axis portion of the magazine type case 3 of a cartridge, as shown in drawing 12 . In drawing 12 , 39 (88) shows the state where this postscript pen 39 (88) was contained with the postscript pen to the medial-axis portion of the magazine type case 3 of a cartridge. By doing in this way, by containing this to the medial-axis portion of the magazine type case 3 at the time of un-using [of the postscript pen 39 (88)] it, since it can treat in one, it becomes convenient. In addition, in drawing 12 , component parts other than the postscript pen 39 (88) are the same objects about CPU31 which is the component part of drawing 1 (b), a scanner 33, the erase head 36, and encoder 37 grade.

[0023]
[Effect of the Invention] Since the spool which becomes easy to deal with it by portability since the flexibility medium by which a display is continued even if it can rewrite as a display free [rewinding in the magazine type case of a cylindrical shape] according to [as explained above] this invention and removes a driving source was contained to the shape of a roll, winds up automatically a roll [of an isomorphous magazine type / opposite side / of a cylindrical shape magazine type case] further /-like flexibility medium, and can be rewound has been arranged, image display becomes freedom more

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TECHNICAL FIELD

[The technical field to which invention belongs] this invention relates to the display unit using the flexible medium in which a continued display is [that high-speed roll-like rewriting is possible and] possible especially about the display unit for a display.

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PRIOR ART

[Description of the Prior Art] As conventional display, there is a display unit for a display using the liquid crystal used even for the electrochromatic display a color TV and for personal computers from the monochrome LCD display of a clock, a camera, etc., Light Emitting Diode mainly used for a segment display etc., the plasma display which can constitute the color display of large-sized and a flat-surface type by the electroluminescence. However, in the above-mentioned conventional example, when the power supply was shut off, even if display, such as liquid crystal, Light Emitting Diode, and plasma, says that all displays will also disappear and shut off the power supply, it had the problem that the power curtailment / storage maintenance type display action that a display can be held was impossible.

Therefore, there was a problem of wasting paper whenever it prints, since there will be only the method of printing a picture by the printer etc. if it is going to leave a display image.

[0003] Then, recently, the possible thing has also been developed for the storage maintenance type display action by impressing electric field, heat, and the MAG with the record medium in which display rewriting is possible. as the electric-field type display of the shape for example, of a sheet itself -- as a "GURIKON electric paper" -- a magazine "SID98DIGEST" -- it is introduced to the 1010-1013rd page That is, it is a display with a thickness of 0.12-0.8mm which carried out bonding of the dichroic sphere of the size whose diameter is 25-100 micrometers between polyester sheets, and a dichroic sphere rotates between the polyester sheet by giving electric field (for example, 40nano J/(square centimeter)), a direction is reversed, the color which was visible until now disappears, and another color appears. Since it adheres to the wall surface of the cavity in which the sphere has held the sphere once rotating, this state is maintained after removing electric field. That is, the record state will continue and will be displayed. Record is eliminated by giving electric field conversely. As a sheet-like heated type display, the sheet-like heated type display is introduced, for example to "the electronic-intelligence communication society technical research report CPM 83-18." That is, if heat is given and the temperature is made a heated type medium from the exterior more than predetermined temperature, color with the another original color will be presented, if it cools conversely, it recolors in the original color, and as a material, it is Ag₂HgI₄, for example. It is, and it is below predetermined temperature, is yellow and more than predetermined temperature, and becomes orange. It is this Ag₂HgI₄ on transparent polyester film. It applies and another transparent polyester film is formed in the shape of sandwiches through a glue line. Performing informational record by the thermal head, maintenance performs ordinary temperature or a heater, and elimination electronically using the thermoelectric-cooling equipment using the Peltier effect. Respectively, it arranges in one train, and it carries out to line sequential, or it arranges in the shape of a field, and carries out by Junji Men. Moreover, the sheet-like MAC type display itself is well-known. Using the magnetic phenomenon in which a magnet attracts iron powder, by giving a magnetic energy to a record medium by the recording head, magnetic powder (toner) suction is performed and after removal of a magnetic energy continues magnetic powder suction to a record medium by remnant magnetism. Elimination is performed by demagnetizing remnant magnetism with the erase head. as the charge of a magnetic powder material -- gamma-Fe₂O₃, Co-nickel-P, and CrO₂ etc. -- it is used When the display panel was constituted, or it tied annularly, it considered as the shape of an endless paper and information was changed combining this and a line head using the record medium by such electric-field control, thermal control, and magnetic control in which a continued display is possible, while the endless medium rotated or the head moved, the head was driven, and the display unit for a display which rewrites the content of a display was known. However, all lacked that the display made with such a record medium was as that it is an endless paper-like **** [and] in portability and practicality. [that it is : panel-like]

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] As explained above, even if it could rewrite as a display free [rewinding] in the magazine type case of a cylindrical shape and removed the driving source, by this invention, the flexible medium by which a display is continued was contained in the shape of a roll. Therefore, since the spool which becomes easy to deal with it by portability, winds up an isomorphous magazine type roll-like flexibility medium automatically to the opposite side of a cylindrical shape magazine type case, and can rewind it to it further has been arranged, image display becomes freedom more and operability improves.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Then, it is for providing about the roll type display which it makes a power curtailment type display action possible so that a display may hold even if the picture in which this invention gave a high-speed picture rewriting indication possible, and wrote it on a flexible display medium by the writing to the rewritable type flexibility medium of the shape of a roll which used the electrical and electric equipment and the magnetic write head is removed in a driving source, and makes possible in the gestalt which can carry out the image display of the rewritable type flexibility display medium from a magazine free to

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MEANS

[Means for Solving the Problem] In order to attain the above-mentioned purpose, invention according to claim 1 is characterized by containing the flexible family name medium in which a continued display is rewritable [as a display] free [rewinding], and possible in the shape of a roll in the magazine type case of a cartridge. Moreover, invention according to claim 2 is characterized by the aforementioned flexible medium displaying using migration of the electrical and electric equipment or the MAG. Moreover, invention according to claim 3 is characterized by the aforementioned flexible medium being a thing containing the mixolimnion of a particle and a fluid opaque medium including a coloring object. Moreover, invention according to claim 4 is characterized by the aforementioned flexible medium being a thing containing the mixolimnion of the particle and the fluid opaque medium containing the magnetic substance. Moreover, invention according to claim 5 is characterized by having arranged the display control section containing CPU which controls the display of the aforementioned flexible medium in the magazine type case of the aforementioned cartridge.

[0006] Moreover, invention according to claim 6 is a roll type display which is characterized by equipping the aforementioned display control section with communication facility with a host computer and in which a continued display according to claim 5 is possible. Moreover, invention according to claim 7 is characterized by equipping the aforementioned display control section with the read of the aforementioned flexible medium, and/or writing / elimination function. Moreover, it is characterized by invention according to claim 8 performing the aforementioned write-in function by the write head which arranges two or more magnetic cells and changes. Moreover, it is characterized by invention according to claim 9 performing the aforementioned write-in function by the write head which arranges two or more magnetic field generators and heating elements, and changes. Moreover, it is characterized by invention according to claim 10 performing the aforementioned write-in function with the pen type head in which a postscript and elimination are possible. Moreover, invention according to claim 11 is characterized by the aforementioned pen type head being removable in the magazine type case of the aforementioned cartridge. Moreover, invention according to claim 12 is characterized by having arranged automatically the spool in which winding and rewinding are possible for the aforementioned isomorphous magazine type roll-like flexibility medium to the opposite side of the magazine type case of the aforementioned cartridge in the roll type display according to claim 5. Moreover, invention according to claim 13 is characterized by having the I/O terminal which contains one or more of CPU, the write head and the erase head, a read scanner, and the encoders in the aforementioned spool, and/or makes communication possible with a computer outside in the roll type display according to claim 12.

[0007] According to the above composition, after pulling out a flexible roll-like display medium from a magazine and displaying a picture, it can rewind in a magazine again. Moreover, display by control of a personal computer, a postscript and writing are attained using personal computer information, writing of a picture, elimination, and read can perform freely to a roll-like flexibility medium, communication with an external computer is also attained and effects, like the postscript of a display and elimination are attained are acquired by tracing the front face of a flexible medium with a postscript pen through an I/O terminal.

[0008]

[Embodiments of the Invention] Hereafter, the gestalt of operation of the 1st of this invention is explained with reference to drawing. Drawing 1 is the perspective diagram of the roll-like flexibility medium display concerning the gestalt of operation of the 1st of this invention. Drawing 2 is the cross-section enlarged view of the capsule type flexibility medium in electric-field mode, and drawing 3 is the expanded sectional view of the microcapsule type two-color ball formula flexibility medium in electric-field mode. Moreover, drawing 4 is the expanded sectional view of the microcapsule type pigment formula flexibility medium in electric-field mode. On the other hand, drawing 5 is the expanded sectional view of the capsule type flexibility medium in magnetic field mode, and drawing 6 is the expanded

sectional view of the microcapsule type flexibility medium in magnetic field mode. And drawing 7 is drawing showing the magnetization property of the magnetic substance for explaining the principle of the flexible medium in heat and magnetic mode. In drawing 1, drawing 1 (a) is the energization force which the perspective diagram of the whole roll type display of this invention is shown, 1 is the roll type display, and the flexible medium in which the continued display of 2 for a display is possible, and 3 are usually carrying out the winding receipt of the flexible medium 2 like a film, and built in the spring (not shown), and is a cylindrical shape magazine type case which rewinds the pulled-out flexible medium 2. 34 is an operation key group which operates internal equipment (after-mentioned), and 55 is an I/O terminal linked to an external computer etc. Drawing 1 (b) is the cross section of the magazine type case shown in drawing 1 (a), CPU of the shape of a cylindrical shape in which 31 forms a personal computer, and 32 are the electrical and electric equipment or the magnetic write head, and a scanner for read in 33, 36 is a head for elimination and many scanner 33 and heads 36 for elimination magnetic write head 32 and for read are perpendicularly arranged in the shape of a line with the drawing, respectively. Since, as for 37, the position data (a thing like the perforation of a film) of the roll-like flexibility medium 2 are also obtained with an encoder, the display of search of a display image etc. is also attained.

[0009] The flexible medium 2 can be displayed using migration of the electrical and electric equipment or the MAG. For example, the capsule type flexibility medium in the electric-field mode shown in drawing 2 mixes the dielectric pigments (TiO₂ etc.) 5 into a medium 4, and impresses electric field in a transparent electrode. When electric field are impressed to the degree in which the color of a pigment 5 is not conspicuous since a pigment is in a uniform mixing state in a medium 4 when there is no impression of electric field from the exterior by the DC power supply from the exterior at a transparent electrode, the dielectric pigment 5 in a medium 4 comes to look in the color of a pigment above the drawing in a medium 4 by electric field like drawing 2 (A), polarization or when [since it was drawn in,] a drawing top to a capsule is Then, even if it turns OFF the DC power supply and abolishes electric field, like drawing 2 (B), with residual charge, frictional resistance, etc., the dielectric pigment 5 in a medium 4 maintains a state [polarization or being drawn in] above the drawing in a medium 4, and the color of a pigment maintains it. Since polarization or the attracted dielectric pigment 5 is attracted below like drawing 2 (C) and it is dispersed to a rose rose, a pigment will be in a uniform mixing state into a medium 4, and the color of a pigment 5 will stop and being upwards conspicuous if electric field are impressed to a transparent electrode with drawing 2 (A) by the DC power supply from the exterior at a retrose. Of course, if it continues giving retrose electric field, it will be completely polarized or drawn in down the drawing in a medium 4, and the color of a pigment 5 will disappear completely.

[0010] The microcapsule type two-color ball formula flexibility medium in the electric-field mode shown in drawing 3 encloses many things which dedicated the two-color ball 7 of the coloring object A attracted by right electric field, and the coloring object B repelled by right electric field in the cavity (microcapsule) in a binder 8, and impresses electric field by transparent electrodes 6 and 6. then, electric field are impressed by the transparent electrode 6 from the exterior -- having (it being a positive electrode to the upper transparent electrode 6 at drawing 3) -- when the coloring objects A attracted by the right electric field of the two-color ball 7 become facing up all at once and it sees from the drawing bottom, it comes (drawing 3 (A)) to be visible to A color of a coloring object After it, even if it removes external electric field, A color grain maintains a state with this by friction with a cavernous wall surface (drawing 3 (B)). And when it sees from a top, B color of a coloring object can come to be seen, since the coloring objects B which the coloring object A in a microcapsule is attracted down the drawing, and are conversely repelled by right electric field will turn to the drawing bottom all at once if reverse electric field are impressed like [exterior] drawing 3 (C).

[0011] The microcapsule type pigment formula flexibility medium in the electric-field mode shown in drawing 4 encloses many microcapsules 7 which mixed the pigment 5 attracted by electric field into the medium (for example, nebula liquid) 4 in a binder 8, and impresses electric field by transparent electrodes 6 and 6. Then, when electric field were impressed to the transparent electrode 6 from the exterior, and the pigment 5 in nebula liquid 4 is attracted upwards and it sees from the drawing bottom like drawing 4 (A), the color of a pigment 5 can come to be seen. After it, even if it removes external electric field, a pigment 5 maintains a state with this by friction with a microcapsule wall surface (drawing 4 (B)). And since the pigment 5 in a microcapsule 7 will be attracted down the drawing if reverse electric field are impressed like [exterior] drawing 4 (C), the color of nebula liquid 4 can come to be seen.

[0012] The capsule type flexibility medium in the magnetic field mode shown in drawing 5 mixes magnetic powder 5' into medium 4', prepares thin layer 6" of the transparent magnetic substance in a front face, and impresses a magnetic field in magnet (magnetic head) 6'. When magnet 6' was brought close to a capsule type flexibility medium from the exterior and a capsule is seen from the drawing bottom since magnetic powder 5' of medium 4' Naka was attracted above the drawing by the magnetic field, it comes (A of drawing 2) to be visible to the black of magnetic powder 5'. Then, even if it removes magnet 6', like drawing 5 (B), by the remnant magnetism of thin layer 6" of the transparent

magnetic substance, a state as it is maintained and the black of magnetic powder 5' continues. and magnet 6' -- a capsule type flexibility medium -- caudad -- bringing close -- if -- a magnetic field -- medium 4' -- since inner magnetic powder 5' is attracted down the drawing, when a capsule is seen from the drawing bottom, the black of magnetic powder 5' disappears and the color of medium 4' can come (drawing 5 (C)) to be seen [black] Of course, the magnetic head can be used instead of a magnet. Although a coil is theoretically rolled and energized to cores, such as a ferrite and cobalt, as the magnetic head in this case and magnetic flux is generated, the device of the various kinds for multichannel-izing is given, and 450dpi,-dimensional [of thousands of or more channels / 1], and a two-dimensional full line multi-head are also possible by the formation of a head array etc. at A4.

[0013] the magnetic powder 5 by which the microcapsule type flexibility medium in the magnetic field mode shown in drawing 6 is attracted by the magnetic field -- a medium (for example, nebula liquid) 4 -- 'the microcapsule 7 mixed in inside' -- a large number -- transparent magnetic-substance binder 8' -- it encloses inside and a magnetic field is impressed in magnet 6' Then, when the magnetic field was impressed by magnet 6' from the exterior, and magnetic powder 5' in nebula liquid 4 is attracted upwards and sees from the drawing bottom like drawing 6 (A), the black of magnetic powder 5' can come to be seen. even if it removes an external magnetic field after it -- the remnant magnetism of transparent magnetic-substance binder 8' -- magnetic powder 5' -- a state with this is maintained (drawing 6 (B)) and if an opposing magnetic field is impressed like [exterior] drawing 6 (C), the remnant magnetism of transparent magnetic-substance binder 8' will demagnetize -- having -- a microcapsule 7 -- 'the inner magnetic powder 5' -- medium 4' -- it becomes a rose rose in inside and the color of medium 4' can come to be seen Of course, the magnetic head can be used instead of a magnet. Although a coil is theoretically rolled and energized to cores, such as a ferrite and cobalt, as the magnetic head in this case and magnetic flux is generated, the device of the various kinds for multichannel-izing is given, and 450dpi,-dimensional [of thousands of or more channels / 1], and a two-dimensional full line multi-head are also possible by the formation of a head array etc. at A4.

[0014] Drawing 7 is drawing showing the magnetization property of the magnetic substance for explaining the principle of the flexible medium in heat and magnetic mode, usually, if a magnetic field is added to the record material of the magnetic substance by the magnetic head at the time of low temperature, since a coercive force and remnant magnetism are large, record material will show the big hysteresis characteristic which big magnetization remains and is shown in drawing 7 (a), and magnetization will be stably held by the meantime. However, if the temperature of such a ferromagnetic is raised and it goes, the hysteresis characteristic becomes thin gradually like drawing 7 (b), when Curie temperature is reached at last, spontaneous magnetization is set to 0 and there is a property of losing the property as a ferromagnetic. Use this phenomenon for the writing by the magnetic head, and it is made to shift to a property like drawing 7 (b) by heating the hysteresis characteristic at the time of low temperature like drawing 7 (a), and it becomes possible, when improvement in the speed of on-off control is promoted or control of the elevated-temperature demagnetization by heating, elevated-temperature flux reversal, etc. uses a heating element together. Thus, since the magnetic head is controllable by temperature, rewriting by temperature mode is also attained.

[0015] As mentioned above, each explanation of drawing 2 - drawing 7 is explanation of one electrode or a magnet (magnetic head) unit. Many such electrodes or magnet (magnetic head) units are arranged in all directions by the flexible medium 2 of drawing 1, required transparent wiring is made for every unit, and wiring is connected to CPU (drawing 9, 21).

[0016] As mentioned above, by constituting from a flexible medium in which display rewriting is possible in the shape of a roll using electrophoresis or magnetic migration, it can be dealt with like a roll and becomes the simple display of handling. Drawing 8 is another example of writing and composition of reading at the display by such flexible medium 2. Drawing 8 (a) and (b) are written-in examples which carry out a scan up and down by line head 86 grade. Moreover, it is the example written in by the magnetic head 87, and drawing 8 (b) is an example added and eliminated with the magnetic pen 88, by tracing a screen with the magnetic pen 88, a postscript can be added and drawing 8 (c) can be eliminated. It is the example which reads the screen added and eliminated in the magnetic pen 88 grade with the line scanner 89 of CCD, and drawing 8 (e) carries out the scan of the display screen from a top to the bottom, and the data which read and read the picture can be inputted into the memory in a magazine 3 (drawing 9, 22), or it can transmit them. These writing and the reading technology itself are common knowledge, and explanation is omitted.

[0017] Operation of elimination by the write head 32 by the operation as this also with the same roll type display 1 shown in drawing 1 write in and according to the erase head 36, a postscript, elimination with a scanner 33, etc. read and according to the write-in pen 39, etc. is performed by the same operation with having explained above. In this case although the read head and the write head are arranged in the length direction of a roll in drawing 8, it differs in that read and the write head are arranged crosswise [of a roll] in the magazine of drawing 1. Thus, the display gestalt which the display excellent also in portability can constitute, in addition is rich in various varieties becomes possible

using magnetic migration or electrophoresis by constituting the flexible medium 2 in which display rewriting is possible in the shape of a roll, as shown in drawing 1 .

[0018] Drawing 9 is the block diagram showing the composition of the display control section (personal computer) 9 which controls the display of the roll type display 2. The display control section 9 is for controlling the display of the roll type display 2, and is equipped with CPU21, ROM22, RAM23, an external interface 24, a communication interface 25, the bit map memory 26, and the display controller 27. DDO, magnetic-disk FD, etc. are connected to an external interface 24 to a postscript pen, a keyboard, a CCD scanner, write-in equipment, a reader, and a field. CPU21 displays the data about processing of the data based on communication with a central host (with no illustration), control of the bit map memory 26, and decode processing of the data in RAM23, i.e., the display in RAM22, on the roll type display 2 through an external interface 24, or controls storing the display information transmitted through an external interface 24 from CCD, the reader, etc. in ROM22 etc. ROM22 memorizes the operation procedure of CPU21. A communication interface 25 interfaces data communication with a central host. the data about the display of the data with which CPU2 delivered and received the bit map memory 26 from the central host -- what is directly recorded on the roll type display 2 inside (bit map data) is stored The display controller 27 displays the bit map data in the bit map memory 26 on the roll type display 2. RAM23 stores data other than the aforementioned bit map data, and shines, and the display information transmitted through an external interface 24 from CCD, the reader, etc. is stored. A postscript pen is used in the case of the writing, a correction, deletion, and a postscript of the information on the roll type display 2 top. A keyboard is used in the cases, such as the writing, read-out, creation, change, a monitor, preservation, etc. of various programs. A scanner is used in the information's on roll type display 2 read-out case. Write-in equipment is used in case information is written in to up to the roll type display 2. Moreover, it is convenient, if it is the writing, read-out, creation, change, the monitor, preservation, etc. of an easy program and you will give a part of function of a keyboard to the above-mentioned operation key group 34 (drawing 1) and a postscript pen.

[0019] Although drawing 8 is the example of the writing and reading by line scan, drawing 10 is the perspective diagram of the non-portable high-speed writing and reader which can perform a field scan. In drawing 10 , 11 is the writing/reader to the roll type flexibility medium by the above-mentioned this invention. The multi-head of a high-density multichannel is possible, by application of a thin film technology, vertical recording, etc., since it becomes package writing by two-dimensional array, if a write time is also compared with a line head etc., using A4 edition 1 page as about 300 dpi, it will become high speed considerably, and the speed for about 0.1 seconds is possible also for the magnetic head used for this. If writing is for example, a magnetic-head type, writing will be performed by the flux reversal by the current passed for every single head corresponding to a picture signal, and read is performed by change of the induced current to which read flows from the magnetic substance of the display medium 2 to a magnetic cell. 12 is the set mouth of the paper-like display 2, and 13 is means of communications with a host computer. If the handling of this writing/reader is explained, the part for which the flexible medium 2 asks from the roll type display 1 will be pulled out, and an insertion set will be carried out at the display set mouth 12 of write-in equipment 11. If the flexible medium 2 is set, writing / reader 11 will perform package writing for A4 edition 1 page by high-speed printing for 0.1 or less seconds by the two-dimensional multi-head based on the transfer data from computers (for example, host computer [Although not illustrated] of the head office etc.). Moreover, when there are a drawing to transmit to a computer from the direction of the flexible medium 2, a changed screen, writing / reader 11 transmits ***** and reading data to a computer through means of communications 13 by writing in similarly and inserting in the set mouth 12 of equipment 11 collectively. Moreover, only when the screen print-out from a computer changes on the occasion of writing, the rewriting writing of the flexible medium 2 is performed. The above can arrange and use well-known electric writing / reader similarly, when using the medium using electrophoresis to the writing/reader to the sheet-like flexibility medium 2 using magnetic migration, although and.

[0020] Next, the gestalt of operation of the 2nd of this invention is explained with reference to drawing. Drawing 11 is the perspective diagram of the roll-like flexibility medium display concerning the gestalt of operation of the 2nd of this invention in which automatic winding rewinding is possible. In drawing 11 , a spool 113 can contain a motor (not shown) in the interior, and can wind up, display and rewind the roll-like flexibility medium 2 like the cartridge of a film, and a receiving spool exactly. A button 114 is an operation button for motorised. Moreover, the composition of the cylindrical shape magazine type case 3 is the same as the gestalt of the 1st operation, and operation of the postscript with elimination by the write head 32 write in and according to the erase head 36, the read transfer with a scanner 33, the write-in pen 39, or the magnetic pen 88 etc. is performed similarly. Thus, in the case of the gestalt of operation of the 2nd of drawing 11 , since it winds up and rewinding is possible, an automatic picture (still picture) to display is pulled out freely, and it can be displayed and placed as he likes.

[0021] You may make it give the function as a magazine 3 that it is the same in a spool 113, as an example of

improvement of the gestalt of the 2nd operation. Namely, although only a motor system is built in in a spool 113 and it can be made to perform automatic winding and rewinding with the gestalt of the 2nd operation By making the write head 32, the erase head 36, and scanner 33 grade build in like the gestalt of the 1st operation in a spool 113, and giving this the same function as a magazine 3 Since a spool 113 side can also operate elimination by the write head 32 write it and according to the erase head 36, the read transfer with a scanner 33, etc., its operability improves further.

[0022] The gestalt of the 3rd operation makes removable the postscript pen (pen type head) 39 or 88 to the medial-axis portion of the magazine type case 3 of a cartridge, as shown in drawing 12 . In drawing 12 , 39 (88) shows the state where this postscript pen 39 (88) was contained with the postscript pen to the medial-axis portion of the magazine type case 3 of a cartridge. By doing in this way, by containing this to the medial-axis portion of the magazine type case 3 at the time of un-using [of the postscript pen 39 (88)] it, since it can treat in one, it becomes convenient. In addition, in drawing 12 , component parts other than the postscript pen 39 (88) are the same objects about CPU31 which is the component part of drawing 1 (b), a scanner 33, the erase head 36, and encoder 37 grade.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the perspective diagram of the note type roll type display concerning the gestalt of operation of the 1st of this invention in which a continued display is possible.

[Drawing 2] It is the cross-section enlarged view of the capsule type flexibility medium in electric-field mode.

[Drawing 3] It is the expanded sectional view of the microcapsule type two-color ball formula flexibility medium in electric-field mode.

[Drawing 4] It is the expanded sectional view of the microcapsule type pigment formula flexibility medium in electric-field mode.

[Drawing 5] It is the expanded sectional view of the capsule type flexibility medium in magnetic field mode.

[Drawing 6] It is the expanded sectional view of the microcapsule type flexibility medium in magnetic field mode.

[Drawing 7] It is drawing showing the magnetization property of the magnetic substance for explaining the principle of the flexible medium in heat and magnetic mode.

[Drawing 8] It is explanatory drawing of the display display by the flexible medium shown in drawing 1.

[Drawing 9] It is the configuration block view of the control section which controls a roll type display.

[Drawing 10] It is the perspective diagram of the non-portable writing and reader used for this invention.

[Drawing 11] It is the perspective diagram of the roll-like flexibility medium display concerning the gestalt of operation of the 2nd of this invention in which automatic winding rewinding is possible.

[Drawing 12] It is the perspective diagram showing the attachment state of the postscript pen concerning the gestalt of operation of the 3rd of this invention.

[Description of Notations]

1 Roll Type Display in which Continued Display is Possible

2 Flexible Medium in which Continued Display is Possible

3 Cylindrical Shape Magazine Type Case

31 CPU

32 Write Head

33 Scanner

34 Operation Button

35 I/O Terminal

36 Erase Head

37 Encoder

39 Write-in Pen

4 Coloring Matter Content Medium

4' magnetism powder content medium

5 Pigment

5' magnetism powder

6 Electrode

6' magnet

6" transparency magnetic substance

7 Ball

7' microcapsule

8 Binder

9 Display Control Section Containing CPU

10 Pen Type Head (Postscript Pen)
11 Writing and Reader
12 Insertion Mouth
13 Communications Department
14 Field Head for Writing
15 Field Head for Read
16 Display Plate
17 Note with Field Head for Writing
18 Magnetic Pen
19 Line Scanner
21 CPU
22 ROM
23 RAM
24 External Interface
25 Communication Interface
26 Bit Map Memory
27 Display Controller

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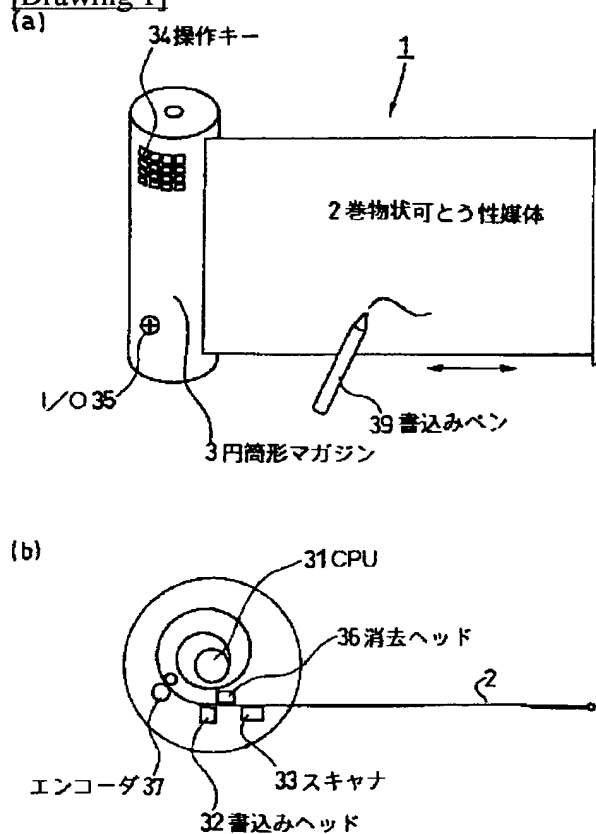
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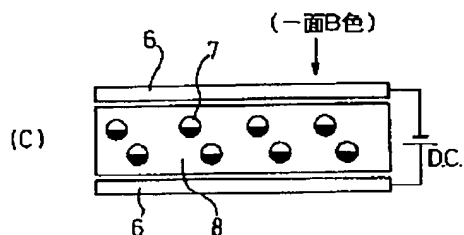
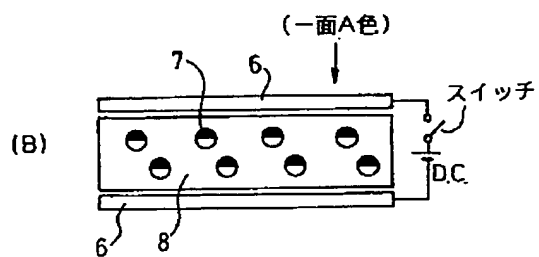
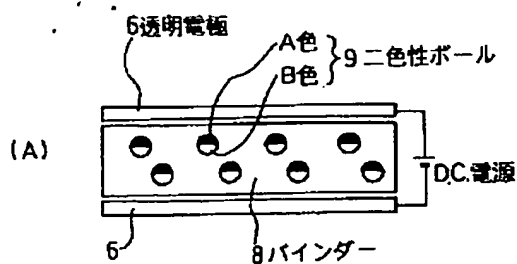
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DRAWINGS

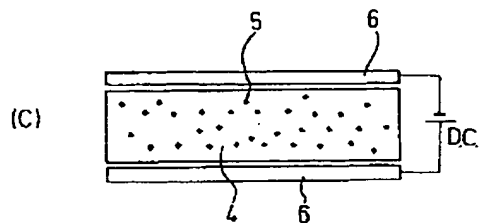
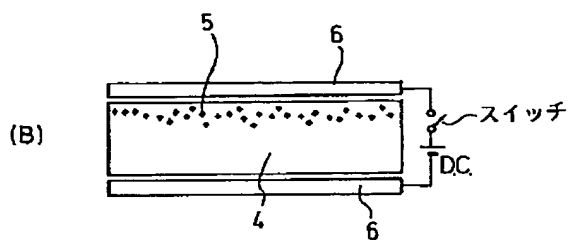
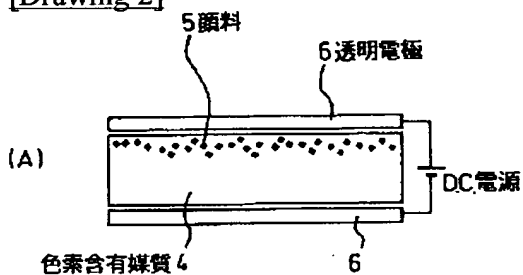
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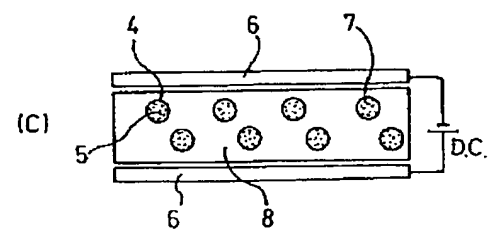
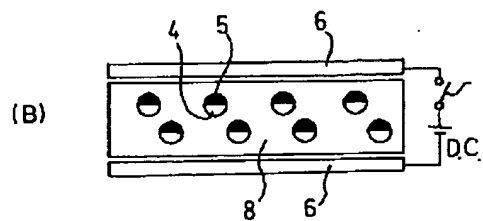
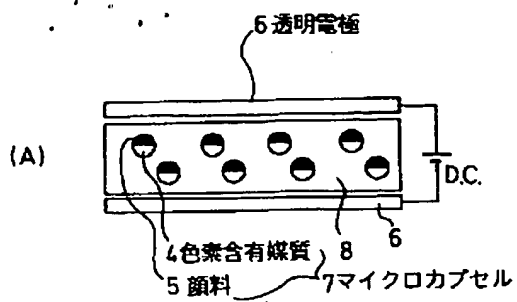
[Drawing 3]



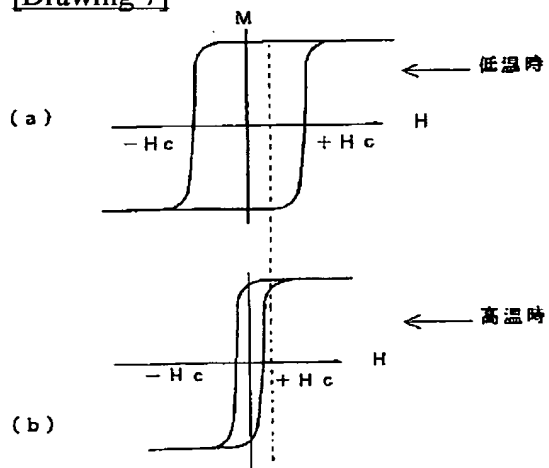
[Drawing 2]



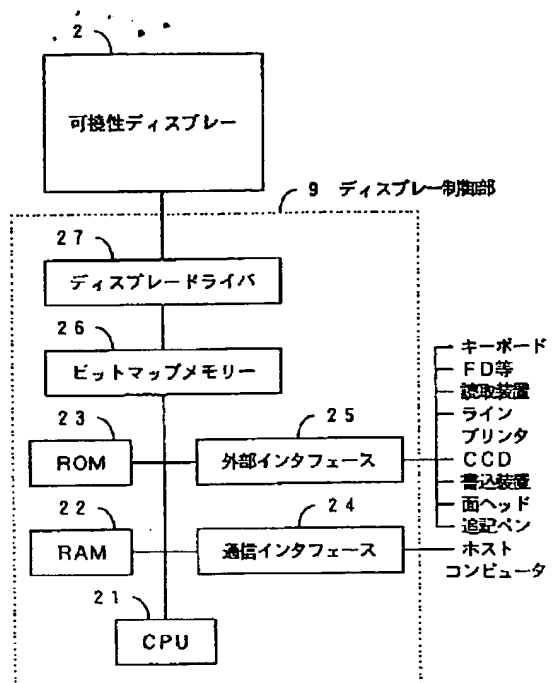
[Drawing 4]



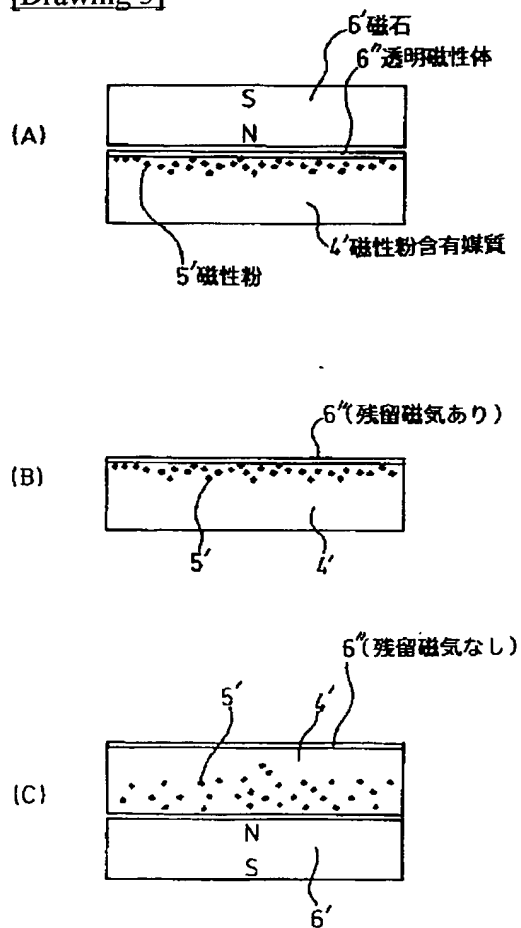
[Drawing 7]



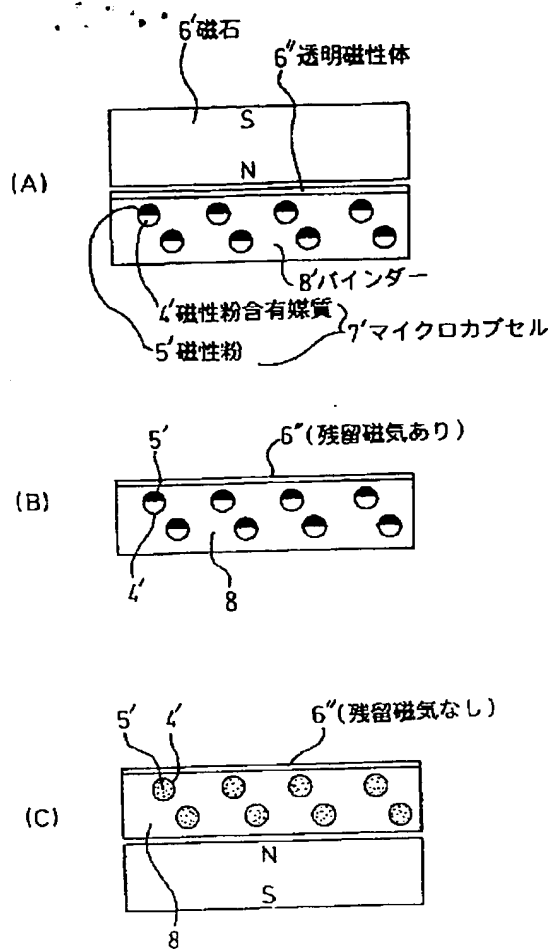
[Drawing 9]



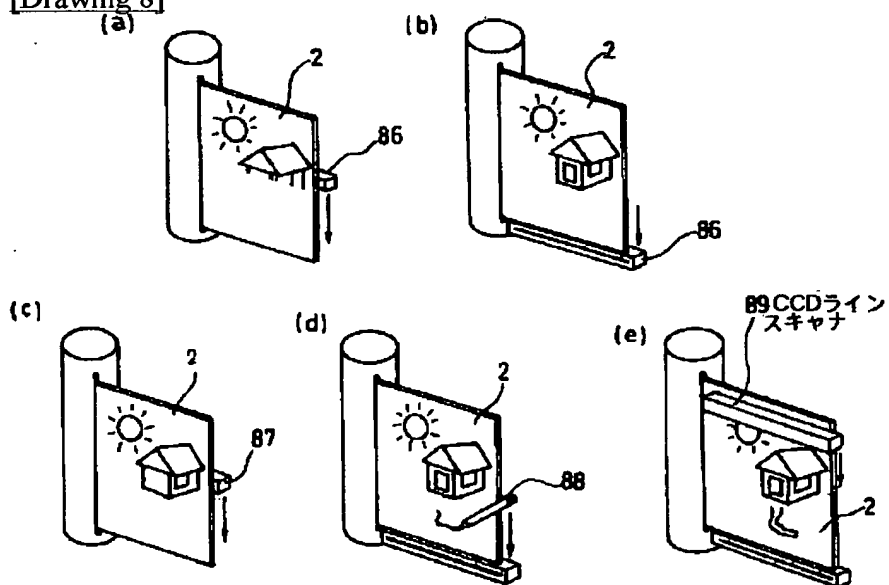
[Drawing 5]



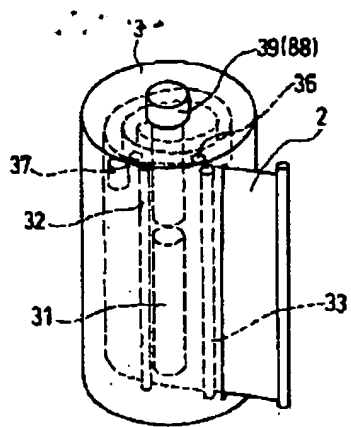
[Drawing 6]



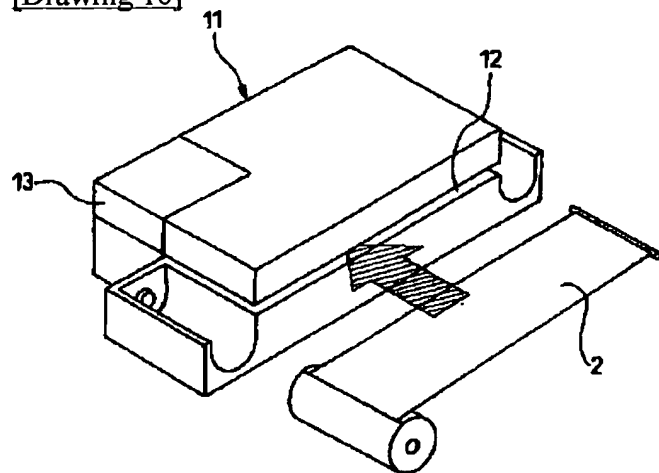
[Drawing 8]



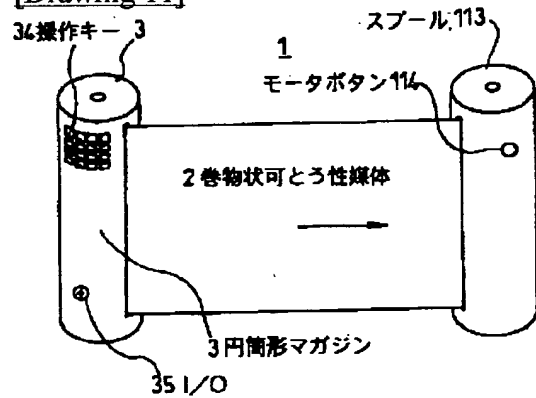
[Drawing 12]



[Drawing 10]



[Drawing 11]



[Translation done.]